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Personal Attributes Contributing to Computer Anxiety and Computer Self-efficacy among Distance Learners

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Abstract

In distance learning, an internet-based learning has been developed as a learning platform for courses, and a distance learner's acquisition depends on his/her personal characteristics. Thus the present study was planned to investigate personal attributes of distance learners that may contribute to their levels of computer anxiety and computer self-efficacy. Five hundred distance learners completed Computer Anxiety Rating Scale and Computer Self-Efficacy Scale along with a personal variables sheet. Results indicated that (1) Computer anxiety is negatively associated with computer self-efficacy; (2) Female and older distance learners reported high computer anxiety and low self-efficacy; and (3)Computer anxiety and self-efficacy regressed upon work experience, computer handling experience, and total number of hours expended for computer work. Identifying these factors may help in designing and implementing learning environments that may better fit the students' needs at distance learning institutes. Though the findings have implications for educational setup, the study should be replicated with mixed-method to analyze the qualitative data as well.

Keywords: Computer anxiety, computer self-efficacy, distance learners, personality traits, computer experience

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Introduction

Rapid growth and advancement in the technology of computer usage has necessitated its application in modern teaching strategies. Innovative educationists are of the view that if we want to prepare human resource to meet the challenges of 1st century in the work place then learning process has to be integrated with the use of most modern computer technology (Butzin, 2000; Hopson, Simms, & Knezek, 2002; Reiser, 2001).

With advancement of communication technologies and a change in the shift of learning paradigm, distance learning has been assumed special significance in the postmodern age. Now use of lap top and internet has been widely used for synchronous activities. This has definitely facilitated to overcome the limitations of traditional distance learning. At present in distance learning institutions throughout the world most of the courses have been structured as internet based. Now there is a dire need to encourage and familiarized students with the most modern computer technology in the learning process.

Despite the increasing role of computer in higher education, researchers have investigated and pointed out some factors such as attitude towards computer, higher self-efficacy and low anxiety in using computer as significant psychological factors in making the people comfortable with the use of computer skills (Busch, 1995). Huang and Kinshuk (2013) addressed the main issues concerned with the trend and future development of learning processes, innovative pedagogies changes, effects of new technologies on education, future learning content. They found that learning technology has been affected by advances in technology development and changes in the field of education. DeLoughry (1993) also provided the statistics that 33% US students suffer from technophobia. However, researcher recommended the factors that may help in using the modern technology in higher education.

Modern technology at times can have certain negative side effects like negative attitudes towards the use of computers and sometimes a person can experience severe tension even before their encounter with computers. Negative emotional states like aggression, high anxiety, tension, and frustration can adversely affect the interaction with the computer, and it will also adversely affect the level of productivity relational life, subjective state of well being and process of learning as well. Factors; the way in which the person initially encounter computer (Brosnan & Lee 1998; Rosen, Sears, & Weil, 1995), failure an achievements in past with computer technology, and use of new software, are all determinants of all type of

psychological problems that a person may face. These investigators have tried to anticipate the factors associated with the experience of anxiety while using computer. Attitudes and self-efficacy for computer use are the factors that are frequently postulated as tempting computer anxiety (Ayersman & Reed, 1995; Igbaria & Chakrabarti, 1990; Reed, Ayersman, & Liu, 1996).

Self-efficacy refers to a confidence a person has in his/her ability that may affect the achievement of goals (Kinzie, Delcourt, & Powers, 1994). Miura has proposed that self-efficacy is one of the most significant factors that facilitate the learning of computer related skills. Compared to the self-efficacy for general, self-efficacy for computer is a particular one which is individual's belief to work with and handle computers. Those people who lack computer self-efficacy may not perform well on computer related tasks (Compeau & Higgins, 1995). In some of the cases, students consider their courses of applications of computer lightly and thus may not perform well. High levels of self-efficacy may lead the students to put up very little endure in learning and applying new concepts of computer. This can adversely affect their performance. However, Brosnan and Lee (1998) is of the view that high computer self-efficacy may increase the performance of the students.

Many studies have reported that computer related behaviors are generally influenced by computer self-efficacy and computer anxiety. Webster and Martocchio, (1992) have postulated that when individuals seek training in the field of usage of computers, their specific efficacy belief for working on computers positively affect performance and success in computers use. Moreover, the learner's preferences for learning of computers skills are affected by the confidence and trust of a learner in computer technology (Bouffard-Bouchard, 1990). When a learner finds himself confident in using the computer, he shows more willingness to learn about computer (Zhang & Espinoza, 1998). While a learner's experience of high anxiety while using computer (Harrington, McElroy, & Morrow, 1990) and impedance for using computers (Torkzadeh & Angula, 1992; Weil & Rosen, 1995) adversely affect the computer related performance.

Male learners have higher levels of computer related self-efficacy compared to female learners. It has been further observed that female learners have higher levels of computer related anxiety and therefore, show poor performance in computer jobs (Brosnan & Lee, 1998; Balka & Smith, 2000). It has been also noted that older students perform much poorly as compared to younger students. The reason might be the slow reflexes of the older people and their rigid attitudes towards new technology (Shaw & Giacquinta, 2000).

These studies demonstrated a sequel of the literature review on use of computer anxiety while using computer, and efficacy belief for computer. Would this apparent trend be exist for distance learners? Keeping in mind this question, the present study focused mainly the three objectives; 1. To assess relationship among levels of computer anxiety, computer self-efficacy, and personality traits in distance learners; 2. To see the differences in experiencing anxiety and efficacy belief for computer use based on gender and age; and 3. To analyze the dependency of computer anxiety on the variables such as experience of work, dispositional traits, experience of computer use, and total time in hours spent for work on computer. It was hypothesized that computer anxiety will be negatively associated with computer self-efficacy among distance learners. It was also assumed that female learners and older students will report higher anxiety and low self-efficacy for the use of computers.

Method

Participants

The sample consisted of 500 distance learners; 235 male learners and 265 female learners enrolled in distance learning institutes. Their age range was between 24 and 46 years. The participants were approached using simple random sampling technique. All the participants were different on their personal and demographic characteristics; work experience, computer handling experience, and working hours spent on computer.

Instruments

Following questionnaires were used to collect the opinion from participants.

1. Personal and Demographic Attributes Sheet. It includes gender, age, work experience, experience in using computer, and total hours spent on computer.
2. Computer Anxiety Rating Scale. It is a 19-item self reported scale (Heinssen, Glass, & Knight, 1987) measuring the anxiety level while using computer. Responses are obtained on a 5-point Likert scale indicating from 1=strongly disagree to 5=strongly agree. Composite scores fall between 19 and 95 showing lowest to highest degree of anxiety for computer use. Internal consistency of the scale was found with .73 alpha co-efficient.
3. Computer Self-Efficacy Scale. It is a 29-items scale (Torkzadeh & Koufteros, 1992) where inevery statement introduced with the word “I feel confident”. Responses are obtained on 5-point Likert scale indicating from 1=strongly disagree to 5=strongly agree. Composite scores placed from 29 to 145 where high scores depict high level of confidence in using computers. Internal consistency of the scale has been reported with .78 alpha coefficient.

4. Five-Factor Inventory. Through 60 adjectives, this inventory assesses five personality traits; Extroversion, Neuroticism, Openness to experience, Agreeableness, and Conscientiousness. Responses are obtained on five points from4=strongly disagree to 0=strongly agree. Some items are reverse scored. Composite score falls between 0-48. Each personality attribute is assessed through 12 adjectives and is scored individually. The reliability coefficient of the scale was found .81.

Procedure

Utilizing survey research design, students were contacted to participate in the study at distance learning universities through their emails taken from offices of universities with the permission of higher authorities of institutes. After obtaining the positive consents from the participants, they were requested to provide their opinion on a booklet containing three questionnaires and one personal information sheet. All the scales were presented in English language. They were requested to fill out questionnaires with their full attention and honesty. They were assured about the confidentiality of their responses.

Results

For descriptive analysis, mean and standard deviation (Table 4), and for inferential analyses, correlation (Table 1), Regression Analysis (Table 2), Independent Sample *t*-test (Table 3), One Way Analysis of Variance (Table 5), and Post-Hoc Test (Table 6) were computed to test the assumptions of present study. All hypotheses were tested at .05 levels of significance.

Table 1

Correlations Matrix among CARS, CSE, &Personality Traits (N=500)

	Computer Self-efficacy	Extroversion	Neuroticism	Openness to Experience	Agreeableness	Conscientiousness
Computer Anxiety	-.71*	-.43*	.65*	-.47*	-.52*	-.35*
Computer Self-efficacy	1.00	.69*	-.42*	.74*	.61*	.62*

*p<0.01

Table 1indicates that computer anxiety is significantly negatively correlated with computer self-efficacy and personality traits of extraversion, openness to experience, agreeableness, and conscientiousness. Results also suggested that personality trait of neuroticism is positively related with computer anxiety while is negatively related with computer self-efficacy. Traits of openness to experience, agreeableness, and conscientiousness are strongly positively correlated with computer self-efficacy.

Table 2

Regression Analysis Showing Impact of different factors on Computer Anxiety

Predictors	*B*	*Std. Error*	*Beta*	*T*	*P*
(Constant)	3.511	1.782		1.97	.049
Work Experience	.670	.041	.621	16.25	.001**
Computer Experience	-.086	.029	-0.121	-2.96	.003**
Time spent for using computer	.052	.035	.075	1.48	.014*

R^2 = 0.54, Adjusted R^2 = 0.53, (F (3, 497) = 91.25, p< = 0.001)

**p< = 0.001, *p< = 0.05

Table 2 shows the results of regression analysis for the impact of work experience, computer experience, and the total time that learners spent on working with computer on computer anxiety. Result implies that these factors are the significant predictors of computer anxiety.

Table 3

Differences in Males and Females' Anxiety and Self-efficacy for Computer Use

Scales Distance Learners		*N*	*M*	*SD*	*T*	*P*
Computer Anxiety	Male Learners	235	59.29	11.10	2.41	0.01*
	Female Learners	265	77.62	12.37		
Computer Self-Efficacy	Male Learners	235	112.09	16.31	1.99	0.03*
	Female Learners	265	87.41	14.73		

df = 498, *p< 0.5

Results (Table 3) indicate the significant gender differences in the levels of computer anxiety and computer self-efficacy. Results suggested that female distance learners reported higher anxiety for computer use and lower self-efficacy for computer use as compared to male distance learners.

Table 4
Age-Wise Differences in the Scores of Computer Anxiety & Computer Self-Efficacy *(N=500)*

Age Groups	*N*	Computer Anxiety		Computer Self-Efficacy	
		M	*SD*	*M*	*SD*
21-30	182	23.89	7.78	26.40	7.43
31-40	160	28.08	6.86	22.82	4.67
41-50	158	23.94	7.11	26.07	5.15

Results indicate that mean score of intrinsic aspiration is higher for authoritative parenting style (*M*=28.08, *SD*=6.86) while the mean scores of extrinsic aspiration are higher for authoritarian (*M*=26.40, *SD*=7.43) and permissive parenting styles (*M*=26.07, *SD*=5.15). Findings suggest that students of authoritative parenting style report more intrinsic aspiration while the students of authoritarian and permissive parenting styles show more extrinsic aspirations.

Table 5
Difference in Scores on CARS& CSE in Terms of Learners' Age

Scales	Source of Variation	*SS*	*df*	*MS*	*F*	*P*
Computer Anxiety	Between Groups	1659.11	2	414.77	1.92	0.04*
	Within Groups	107757.20	497	272.80		
	Total	109416.31	499			
Computer Self-efficacy	Between Groups	1285.22	2	428.41	2.13	0.01*
	Within Groups	107936.32	497	272.56		
	Total	109221.54	499			

*$p \leq 0.05$,

Results (Table 5) report that age is the function producing differences in degree of anxiety for computer and efficacy for computer use. A post hoc test (Scheffe Test) was performed to measure the mean differences that contribute in the significant amount of age effects.

Table 6
Multiple Comparisons for three Groups of Studentson the CARS & CSE

	Age Groups (i)	Age Groups (j)	Mean Difference (i-j)	Standard Error	*p*
Computer Anxiety	21-30 yrs	31-40 yrs	-4.1933	1.6021	.102
	21-30 yrs	41-50 yrs	-5.00E-02	2.0683	.001**
	31-40 yrs	41-50 yrs	4.1433	1.8499	.07
Computer Self-efficacy	21-30 yrs	31-40 yrs	3.5843	1.2936	.09
	21-30 yrs	41-50 yrs	0.3308*	1.6700	.03*
	31-40 yrs	41-50 yrs	4.5635	1.4937	.24

*$p < 0.05$, **$p < 0.01$

Multiple Comparisons (Table 6) show the significant differences in the mean scores of anxiety and efficacy for computer use between two groups of students aged 21-30 years and 41-50 years. It suggests that students aged 41-50 years report higher anxiety and low efficacy belief for computer use than the other two age groups.

Discussion

The main objective of the current research was to assess the relationship between level of anxiety and efficacy for using computer. Results showed the significant negative association between anxiety and efficacy for use of computer. This finding is in support of study conducted by Zhang and Espinoza (1998). They found that individual's efficacy belief in computer use is adversely correlated with anxiety that one experience while using computer. They explained that students who score high on self-efficacy, experience low anxiety when use computers.

Findings from the present study also indicated that gender and age made the greater differences in the anxiety and efficacy of computer use experienced by distance learners. This is consistent with some of the previous studies such as Sagiv, and Roccas, (1998) and Whitely, (1997) who supported gender and age as significant factors in reporting the anxiety and self-efficacy towards computer use. Thus, the present study in consistent with previous several studies has confirmed the significance of gender and age in distance learning. Gackenbach (1998) proposed that male/female difference in using computer is yet germinate because females are found to be more anxious when are asked to work on computers. However, a small number of researches are available to oppose the gender effect in experiencing the computer anxiety. For instance, in a research conducted by Brosnan and Lee (1998), male students were found with higher level of anxiety for computer as compared to female students.

Present study also confirmed that male distance learners show more self-efficacy in use of computers than female distance learners. This discovery has been supported by the findings of study conducted by Kraut, Patterson, Lundmark, Kiersley, Mukopadhyay, and Scherlis (1998) who explored that men as compared to women were more confident about the usage of computer technology. Busch (1995) also reported that computer self-efficacy was higher among male students studying in distance learning institutes, and therefore don’t feel any anxiety whenever there is any assignment given to them by their distance teachers. Furthermore, males approach more arenas, use computer frequently, and spend more time as compared to female students.

Another significant factor that had important role in academic performance is the age of distance learners therefore, it has been found in the present study as an important factor which should be carefully looked in distance learning performance. Findings suggested that older students experience low computer self-efficacy and in result they experience higher computer anxiety. This finding, therefore, lends credence to Fulkerth (1998) assertion that the academic performance of distance learners is influenced by older students. He found that younger distance students perform well during the course online than older students.

In this study some other factors such as work experience, computer experience, and time spent for using computer are also found significant influencer for computer anxiety. Results from Regression Analysis have provided the statistical evidence that learners' experience of work and particularly their experience in use of computer affect the computer anxiety. These findings are supported by the work of Chua, Chen, and Wong, (1999) who conducted a research on computer anxiety and its correlates. They found that computer anxiety is linked with computer experiences and the time period a student spends in practicing computers.

Conclusion

Present study has extending the previous literature by affirming the findings for effects of personal attributes to computer anxiety and computer self-efficacy. Findings provided the evidences for the contributing roles of gender, age, computer related factors, and personality traits in computer related anxiety and efficacy. Results suggested that female than male students and older than younger students both showed higher computer anxiety and low efficacy for computer using. High work experience, computer experience, and time spent on computer working are the significant factors of computer anxiety. Personality traits are also found to be related with experience of computer anxiety and computer self-efficacy.

Limitations and Recommendations

Though the findings of the current study are of significant values and provide a comprehensive understanding of the factors affecting computer use in learning process, it bores some limitations as well. First, the data have been collected online from the participant that might be a barrier for most of the students to provide their opinion regarding computer usage in their learning. Secondly, questionnaires measured only the quantitative data and lack the qualitative information from the participants. Therefore, it is suggested that the study should be replicated by using mixed method approach for collecting qualitative data as well from the participants in person.

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